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DATAMATION

INTERNATIONAL EDITION NOVEMBER 1 $3 © TECHNICAL PUBLISHING

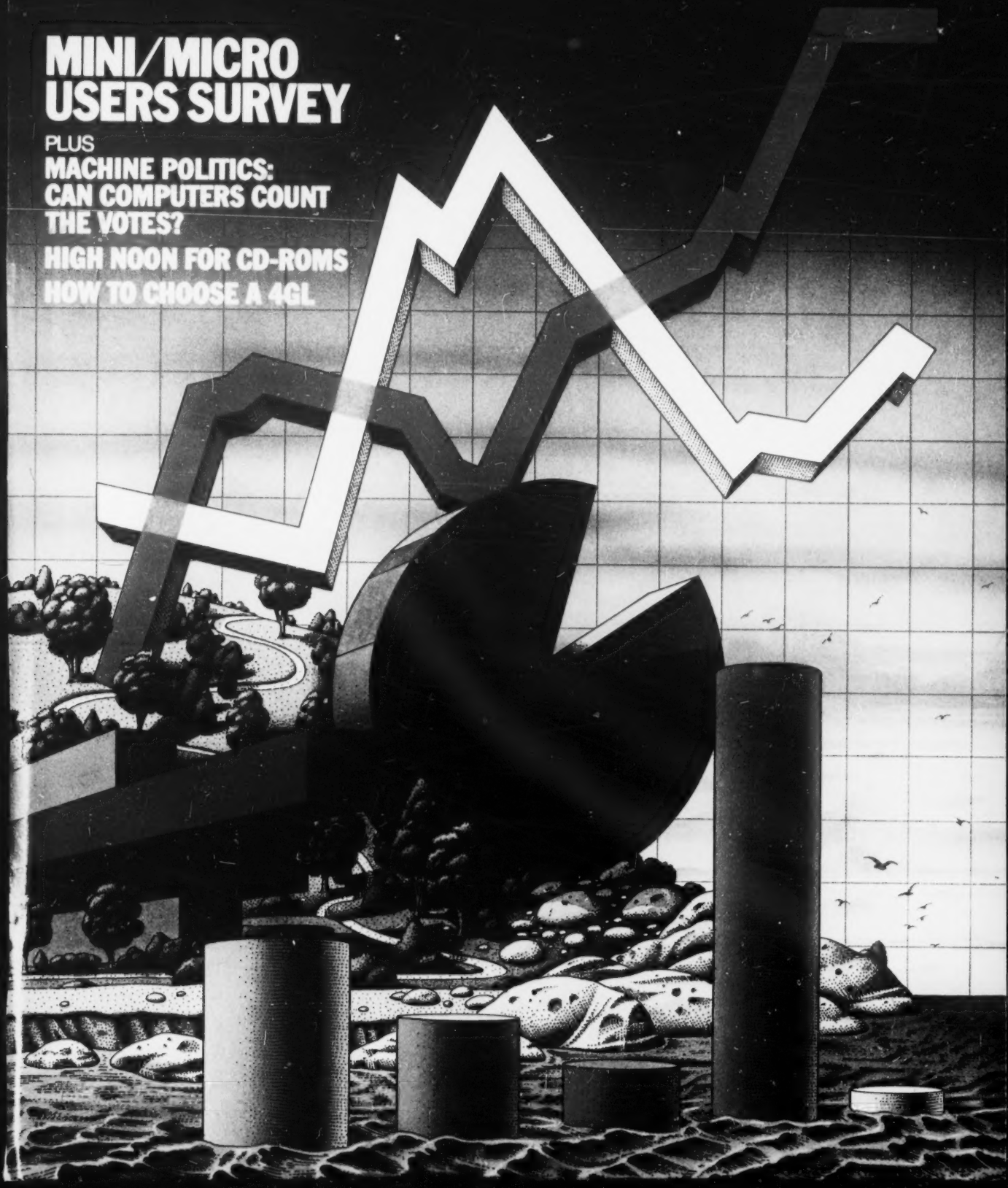
MINI/MICRO USERS SURVEY

PLUS

MACHINE POLITICS: CAN COMPUTERS COUNT THE VOTES?

HIGH NOON FOR CD-ROMS

HOW TO CHOOSE A 4GL



DATAMATION

NOVEMBER 1, 1986/$3 U.S.A.
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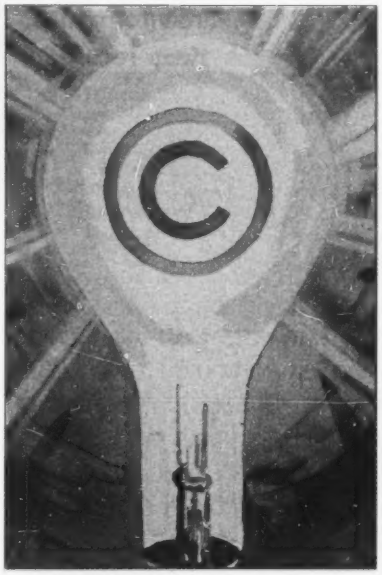

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LETTERS

MBAS AND MIS

Your editorial, "MBA Students Need More MIS" (Sept. 1, p. 19), and Michael Tyler's article, "MIS for MBAs, or Vice Versa?" (p. 46), are really on target in making it clear that good information systems are key to good business performance and are important elements in MBA education. I hope that DATAMATION will continue and expand its coverage of this important area.

The CISMER (Center for Information Systems Management, Education and Research) Research Group here at the University of Delaware believes that effective machine-based information systems must complement the other information systems in the organization and that MIS programs for MBA students need to address a variety of information systems-related organizational issues.

LOUISE H. JONES
Director, CISMER
University of Delaware
Newark, Delaware

I don't know why, since I almost never read editorials, but I read "MBA Students Need More MIS" in the Sept. 1 issue. My comment is to quote the inimitable Colonel Potter (of *M*A*S*H* fame) and say, "Horsehockey!"

Certainly, "there is solid agreement among professors on the need for such education." If I were a professor I would say the same, in the interests of saving my own job. Being an MBA (Northwestern, 1967) provides me with the experience and background to say that the two MIS courses (one undergraduate and one graduate) I took are more than adequate for a generalist degree. After all, the MBA graduate is specifically not required to have the detailed knowledge to solve the problem, but only to know whom to see in order to obtain the answer and to direct and guide the solution. If you want to add courses to assist MBA holders, make them courses in industrial psychology, dealing with people, communications, etc.

If you want a reasonable opinion, talk to the people in the trenches, not the ones interested in preserving their jobs.

RICHARD F. DUFNER
Vice President, Finance
American Tape
Marysville, Michigan

I read Michael Tyler's article, "MIS for MBAs, or Vice Versa?" with great interest. I, myself, have an MS in MIS. I am a computer professional, not a "management type," and chose the MIS program in the business school for two reasons. I wasn't interested in an MBA, and I didn't feel the computer science department was very good at the time.

The MIS curriculum was thorough and rigorous. I took a range of business overview courses (economics, accounting, management, etc.) but the major thrust of the program was on using information systems (read: computers) to solve business problems. With such courses as database systems, decision support systems, operating systems, statistics, et al., and with a thesis topic that used a simulation language to model a business networking situation, I feel I got a well-rounded educational background on which to build my business experience.

MIS is not just for techies. It is a discipline which, if presented properly, can teach problem solving techniques that are applicable to a wide range of applications. Most CS students haven't the foggiest idea of how a business is run and most MBA students know little more than where the on/off button is on their terminals—MIS is the best of both worlds!

C.J. FALK MILOSEVICH
Computing Services Office
University of Illinois
Urbana-Champaign, Illinois

BOMB

Peter Krass's review of *The Computer Pioneers* (Source Data, Aug. '73) contains several unfortunate errors in its account of the bombing of Coventry in November 1940. Colossus was not used for the decoding of the "Korn" messages since Colossus was not built until 1943. The Korn messages were in the Luftwaffe version of the Enigma cipher and were decoded by the Bombe machines; Colossus was designed expressly for the purpose of attacking the Fish cipher, a more complex version of the basic Enigma. Although Winston Churchill, upon receipt of Enigma decodes on the evening of the raid, decided that the raid was probably destined for London (and insisted upon returning there along with his staff), Air Ministry staff opinion had been divided for several days over whether the forthcoming raid would be in the English Midlands (where Coventry is located) or in the South; consequently, defensive measures were thinly spread to cover both possibilities. The problem was further compounded by an error in measurement of the modulation frequencies of the German navigational beams which rendered the British jamming ineffective on the night in question. Several recent texts have provided overwhelming evidence that Winston Churchill took no direct part in the interpretation of the confused evidence available prior to the fateful raid on Coventry. Only in the sense that he was, in addition to being prime minister, minister of defense and thus responsible for the actions of the armed services can Winston Churchill be said to have "laid an egg."

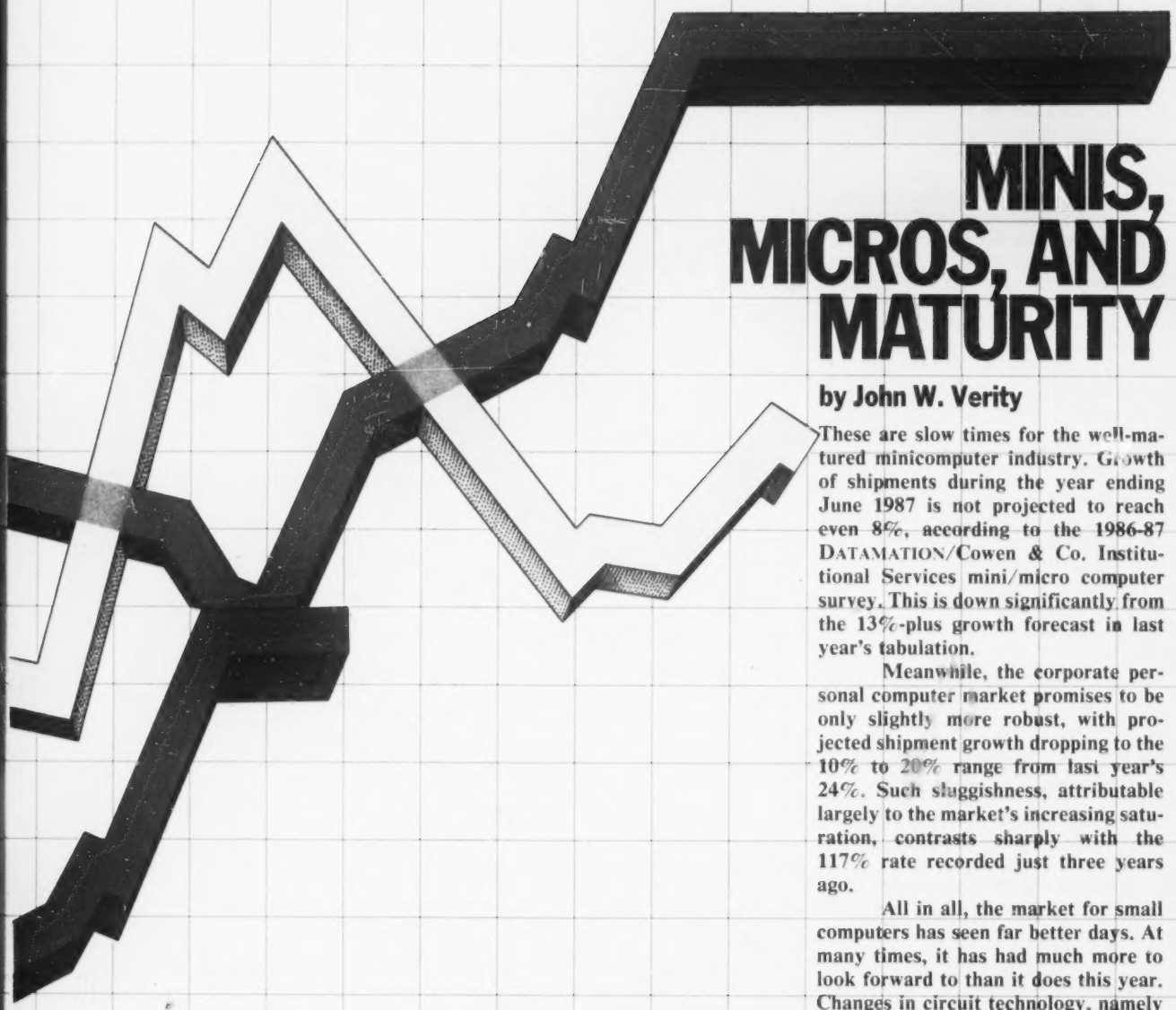
Incidentally, apart from using vacuum tubes, the capabilities of Colossus were remarkably similar to those of the first Altair microcomputers—including the reliability!

CHRIS WHETTON
Levittown, Pennsylvania

CORRECTION

In "Salary Survey: Small Change for Dp Pros," (Sept. 15, p. 72) a box illustrating inflation's affect on salaries since 1981 contained two wrong dates. In the chart titled "Inflation's Bite, the Five Years After 1981," the first column should be labeled "1981 Salary", the second, "1986 Salary."

DATAMATION's annual mini/micro survey finds sales flat, growth down, the outlook indifferent.



MINIS, MICROS, AND MATURITY

by John W. Verity

These are slow times for the well-matured minicomputer industry. Growth of shipments during the year ending June 1987 is not projected to reach even 8%, according to the 1986-87 DATAMATION/Cowen & Co. Institutional Services mini/micro computer survey. This is down significantly from the 13%-plus growth forecast in last year's tabulation.

Meanwhile, the corporate personal computer market promises to be only slightly more robust, with projected shipment growth dropping to the 10% to 20% range from last year's 24%. Such sluggishness, attributable largely to the market's increasing saturation, contrasts sharply with the 117% rate recorded just three years ago.

All in all, the market for small computers has seen far better days. At many times, it has had much more to look forward to than it does this year. Changes in circuit technology, namely the widespread adoption of VLSI chips, have shortened delivery lead times for many key products and thus reduced the need for systems houses and oems to place massive orders as a means of maintaining future inventories. For this and other reasons, there seems little likelihood of a major cyclical resurgence in minicomputer growth as was seen in 1984.

Nevertheless, the rather dismal outlook for small computers is not without its bright spots. Workstations, those relatively high-powered, single-user machines that sell for $7,500 and

up, are selling particularly well—and taking significant business away from traditional minicomputers. Office systems in general are selling above average, too. Digital Equipment Corp., in particular, is winning new market share from IBM and other vendors in both sectors and evidently is enjoying above-average user loyalty. On the other hand, despite much public criticism of the product, IBM's System/36 is enjoying respectable demand. IBM still dominates the organizational market for personal computers, even though it's suffering increasing competitive inroads by the PC clones.

Some other survey findings follow:

- Despite the introduction of new circuit technologies and systems architectures that provide great improvements in price/performance, raw performance itself is not yet an important enough factor to lure most users away from their current minicomputer vendors.
- Compaq, the Houston supplier of transportable IBM-compatible computers, has bumped Apple as the number two pc supplier to the corporate market.
- Santa Clara-based Intel appears to be enjoying a near tripling of orders for its microprocessor chips, taking over from Motorola as the leading microprocessor supplier in this survey.
- IBM's token ring looks as if it will double its share of local networks installed by respondents as of June of next year.
- Growth in the use of Lisp, a language popular in so-called artificial intelligence applications, has tapered off compared with last year.
- Data processing hardware budgets will continue to grow at a lesser rate—only 8.6% a year, compared with the 11.8% measured in 1982—over the next few years.
- For the next generation of machines, personal computer users say they are interested most in additional processing speed and better communications capabilities.

THE BOOM TIMES ARE OVER

Although growth in personal computer shipments is still well ahead of that for minicomputers, the boom times are over and show no signs of returning. Asked to look ahead and compare their pc spending for the year ending June 1988 with that for the current year (ending June 1987), the survey's respondents were not particularly optimistic. Only 35% of them, down from a high of 54% in the 1983 survey, expected their pc spending to be higher in that future year. About a quarter of them said spending would be lower.

As in previous years, the survey measured users' spending for small com-

FIG. 1

TOP DOZEN MINICOMPUTER SYSTEMS 1986-87

A. Based on number of respondents acquiring systems (7/86-12/87)

MANUFACTURER	SYSTEM	NUMBER OF SITES ACQUIRING	AVERAGE UNITS PER SITE
DEC	MicroVAX-2	287	2.7
IBM	System/36	197	3.7
DEC	VAX, unspecified	114	2.2
DEC	VAX 8200	74	1.3
IBM	System/38	70	1.2
DEC	VAX 8600	44	1.3
DEC	VAX 8500	42	1.4
Hewlett-Packard	3000, unspecified	39	2.2
IBM	Series 1	33	7.4
DEC	PDP-11/73	31	2.7
DEC	VAX-11/780	31	1.4
DEC	VAX-11/750	30	1.3

B. Based on number of units being acquired (7/86-12/87)

MANUFACTURER	SYSTEM	NUMBER OF UNITS BEING ACQUIRED	EST. VALUE ($ MILLIONS)
IBM	RT PC	1,209*	$12.9
DEC	MicroVAX-2	787	36.5
IBM	System/36	721	36.6
Burroughs	B25	537	2.8
Honeywell	DPS 6, unspecified	386	8.0
Texas Instruments	Business System, unsp.	385	8.5
NCR	Tower XP	301	6.9
DEC	VAX, unspecified	256	55.0
Wang	VS 6	252	5.6
IBM	Series 1	245	12.0
Sun	Sun-3, unspecified	167	3.4
NCR	Tower, unspecified	107	4.0

*Includes a 1,000-unit purchase by a single respondent organization (a university prominent in computer-related research and education).

FIG. 2

ONLY MODEST SPREAD IN USAGE OF UNIX DURING LATEST 12 MONTHS

Query: What if any plans do you have for the use of Unix (Ultrix, Xenix, etc.) as your primary or secondary operating system?

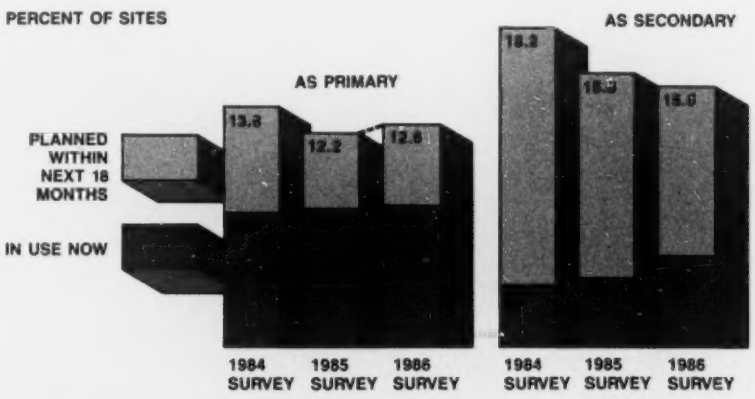


FIG. 3

ORIGINAL VAXs LESS IMPORTANT TO DEC

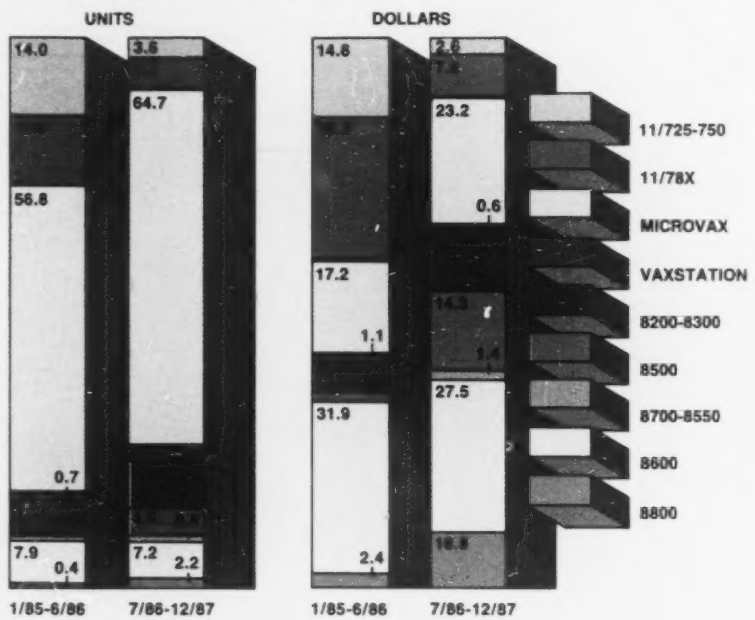
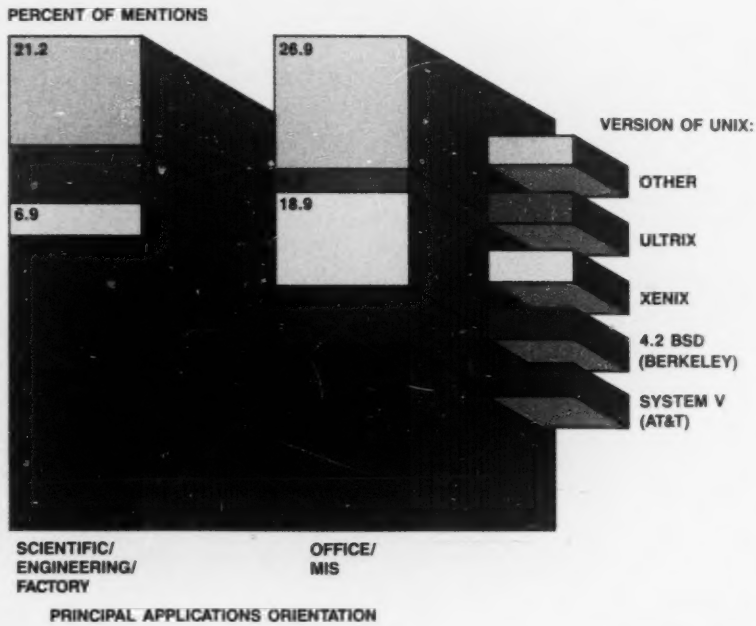


FIG. 4

SYSTEM V MOST WIDELY USED VERSION OF UNIX IN LABS AND OFFICES

Query: If already using Unix or planning to, which version?



puters during the previous and forthcoming 18-month periods (see "Survey Method"), and tallied their responses to questions about a wide range of specific economic and technical topics. One of these topics is the all-important issue of pricing, which can be quite volatile in this end of the computer market.

End users this year reported a slight increase—12.4% vs. the 11.6% recorded last year—in the price concessions (above and beyond normal quantity discounts) they received from their minicomputer vendors. Oems and systems houses reported average concessions of 19.5%, up from 18% last year.

Some of the largest concessions were reported by those respondents that purchased machines from Apollo and Sun Microsystems, two of the leading workstation vendors. Vendors were reported to discount workstations an average of 16.4% off list prices, compared with only 10.7% in the less competitive small business systems arena.

On the whole, list prices in all systems categories were found to be falling. The average minicomputer system price for the 18 months before July 1986 was $83,800, but during the following 18 months, the price was expected to be only $71,200. The average workstation price will fall to $18,500 from $28,000.

Looking ahead 18 months, the survey found that 81% of oem/systems house sites, up from 77% last year, indicated that their current minicomputer inventories were "about right." Only 7% of those sites, down from 12% a year earlier, described their inventories as "too high." This is seen as a sign of confidence among these sites that, if business should pick up, needed hardware can be procured quickly and in sufficient quantities. In other words, the minicomputer business as a whole has lost some of its cyclical nature.

Fig. 1 shows a ranking of the machines that survey respondents said they intend to purchase during the year and a half ending Dec. 31, 1987. Notably, two VLSI-based machines, DEC's MicroVAX-2 and IBM's System/36, show up as two of the most popular machines for the near term.

In terms of the dollars they plan to spend for minicomputers, respondents indicated they would increase substantially their purchases of DEC gear. In the previous 18 months, they spent 36.5% of their money with DEC, but in the following period they planned to spend 40.9%. IBM's share, by contrast, was seen falling to 18.1% from 19.3%. This seems to indicate that DEC is gaining market share from the industry leader. Hewlett-Packard's spending was

projected to hold around 6%, but that may not take place, given the company's post-survey disclosure of technical problems with the new 32-bit Spectrum line.

DEC's share of minis planned for use in scientific, engineering, and factory applications was projected to rise slightly to 52.3% from 51.6%; IBM's share of total dollars in that category is expected to fall to 7.8% from 8.4%. In the highly competitive workstation market, DEC stands to receive 31.7% of the total respondent dollars, compared with 39% previously, while Mountain View, Calif.-based Sun's share goes to 14.7% from 11.4%. (Apollo's share was recorded as falling to 7.5% after the survey from 10.1% before, but it should be noted that the survey ignores the international market, where the Chelmsford, Mass., company is understood to be a relatively strong player.) Finally, DEC seems to be the big winner in office minicomputers, where it competes with the All-in-One software package. There, DEC stands to see its share of spending rise to 35.3% from 27.7%; IBM in that category will see its share fall, to 17.9% from 24.3%; Wang's share will go to 9.0% from 8.0%.

STRONG DEMAND FOR VAX

DEC, the leading mini vendor, is enjoying strong demand for its VAX line, particularly relatively new models such as the 8650 and MicroVAX. Pre-1984 VAX models, namely the 11/XXX series, will account for only 10.4% of the dollars respondents said they would spend for VAX hardware in the following 18 months (see Fig. 2); that is far less than the 41% those machines contributed during the previous like period. The model 8800's dollar contribution will rise to 10.8% from only 2.4% earlier. But it is the MicroVAX-2 that is doing best: in both scientific and commercial applications categories it is the model of choice for more than half of those using VAX systems (including both end user sites and oem/systems houses).

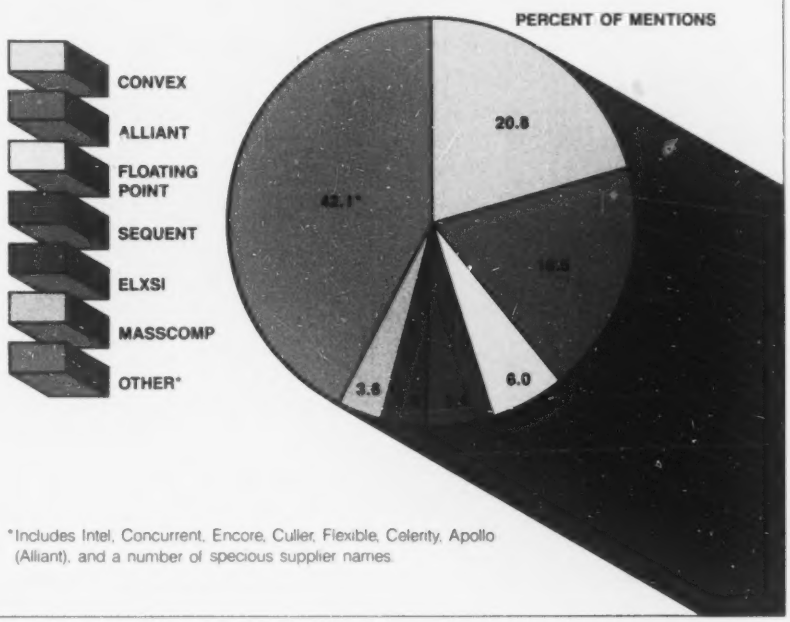
Data General sites plan to spend 42% of their upcoming dollars on MV/20000 systems, 28% on MV/10000s, and 4.2% on MV/8000s. These figures compare with the previous 18 months' respective figures of 8%, 43%, and 21.5%.

Prime sites are primarily using the company's model 9950/9955, which stands to garner 55.4% of the dollars to be spent in the following 18 months, down slightly from 60% in the previous like period. Shipments of the model 2350/2450 are also strong, accounting for 52% of the Prime Series 50 units to be ordered by respondents and 24.6% of the dollars (up from 5.2% and 5.1%, respectively).

FIG. 5

CONVEX AND ALLIANT LEAD STILL YOUNG MULTI/PARALLEL PROCESSING MARKET SEGMENT

Query: If you have an interest in multi- or parallel-processing systems, which, if any such systems, actually are being considered?

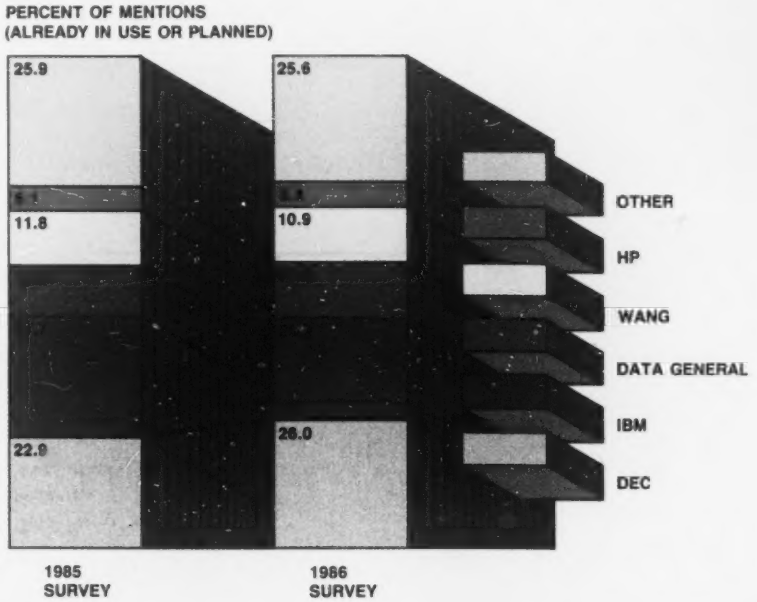


*Includes Intel, Concurrent, Encore, Culler, Flexible, Celerity, Apollo (Alliant), and a number of specious supplier names.

FIG. 6

DEC SHARE OF INTEGRATED OFFICE SYSTEMS MARKET UP DURING PAST 12 MONTHS

Query: If your organization has an integrated office system already in use or planned, whose?



Hewlett-Packard's shipments through the end of next year appear to be heavily dependent on its 16-bit model 3000 systems, which as a family are over a decade old. The survey, taken several months before the firm's problems with the 32-bit Spectrum line were disclosed, showed users planning to spend 72% of their HP dollars on model 3000s, down from 78% for the previous 18 months. Spectrum was expected to account for 10.6% of their spending with HP and 5% of the HP units shipped.

Once again, the survey looked into the desire among users for fault tolerant systems and discovered a slight uptick. Asked if they would like their mini vendors to offer such capability, 40.5% said yes, but only for no extra charge; 14.8% said yes, even if it cost extra; and 3.6% said they already had such capability installed. These figures compare to last year's respective tallies of 36%, 15%, and 3.1%.

The two biggest names in fault tolerant computing are Tandem Computers, Cupertino, Calif., and relative newcomer Stratus Computer, Marlboro, Mass. Despite aggressive marketing and a contract to supply IBM with its machines, Stratus's share of the respondents' planned spending for fault tolerant systems is expected to stay put at around 13% this year. Not a single Stratus-built IBM System/88 showed up among the machines cited by survey participants. Tandem's own aggressive product cycle is evidently helping it maintain market share.

ITS OWN BEST CUSTOMER

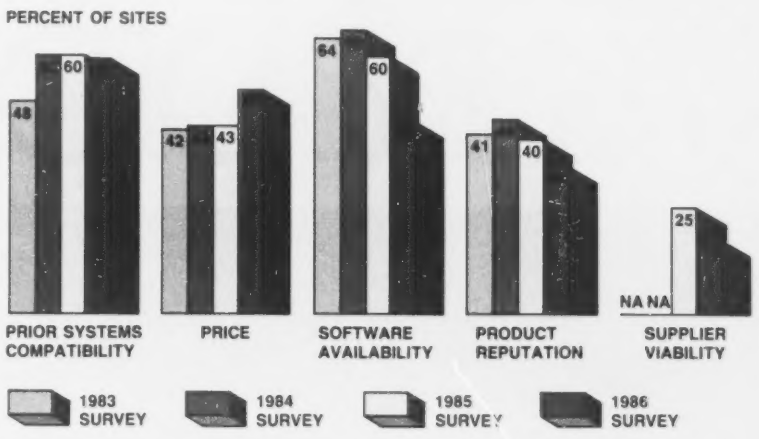
AT&T is still its own best computer customer, but it has made substantial inroads with others. With particular strength in timesharing and with customers in the manufacturing, education, and government sectors, 45% of the company's 3B machines will be shipped to non-AT&T sites, according to the survey. This constrasts with a figure of only 24% during the preceding 18 months. Meanwhile, DEC's share of future AT&T survey site purchases of minis will remain substantial, accounting for 5% of all such units.

Dear to AT&T's heart and central to its marketing strategy, but not exactly catching on like wildfire, is the Unix operating system. Its use appears to be rising among the survey population, but at an extremely modest rate. All told, only 8% of the survey's respondents designated Unix (or a derivative thereof, such as Ultrix or Xenix) their primary operating systems; another 4.6% said they planned to install such an operating system during the next 18 months (see Fig. 3). Even among AT&T sites, demand for personal computers using

FIG. 7

PRICE GAINS IMPORTANCE AS PC BUSINESS ACQUIRES COMMODITY ORIENTATION

Query: What are the three most important criteria in your selection of a pc supplier?



Other factors deemed much less important:

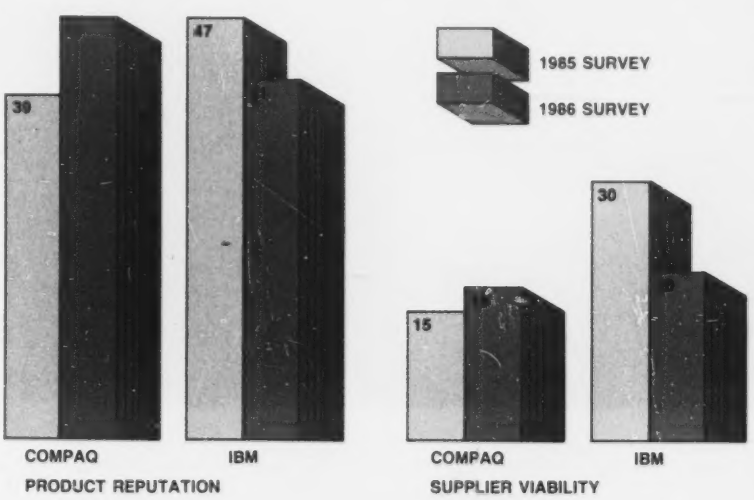
	1985 %	1986 %
Networking Capability	NA	18
Ease of Learning/Use	12	11
Display/Graphics Quality	9	9
Disk Capacity	5	5
Portability	5	3

NA: not available

FIG. 8

ON LATEST SURVEY, COMPAQ RATED AHEAD OF IBM ON PRODUCT REPUTATION

Query: What are the most important criteria in your selection of a pc supplier?



MS/DOS far outranks that for Unix-based machines—95% to 5%. As seen in last year's survey, only a quarter of all survey respondents called multi-user (e.g., Unix) capability "very desirable" for pcs.

Doubts remain about the appeal of the AT&T-developed operating system, which still finds its greatest use among scientific and factory computing sites: 13% of them said it was their primary choice. In a list of 12 criteria used to select a mini vendor (e.g., cpu performance, price, compatibility with prior system), Unix was judged least important by both scientific and commercial users. Finally, it was found that while AT&T's System V version is still the most widely used Unix version (36.4% in use now), it is Microsoft's Xenix (rising from 14.5% in use now to 19.2% planned for the next 18 months) that is proliferating fastest (see Fig. 4). This holds true for both scientific and commercial computing.

Besides Unix, the survey paid particular attention to the recently emerging market for parallel and multiprocessing minicomputers, which are designed to provide extremely high computational rates. A dozen or so companies have entered this field in recent months, many funded by great amounts of venture capital, but judging by this survey they will have a tough time fighting over a still limited market. Even among scientific sites, which would seem to have the most need for extra computing horsepower, 22% said their applications would warrant these new machines, but just 10% of all survey sites said so. The most desirous of these high-performance machines are the petroleum/natural gas, military, and transportation equipment industries. Not surprisingly, the most likely applications areas for such machines are in artificial intelligence and scientific and engineering computation. Only 4% of IBM minicomputer sites (compared with 35.7% of Sun sites) expressed interest in the machines. Convex Computer, it was found, showed the most appeal so far with respondents, garnering 21% of the mentions; it was followed by Alliant, Floating Point Systems, Sequent, Elxsi, and Masscomp, in that order (see Fig. 5).

As has been seen in previous surveys, personal computers and workstations are becoming the machines of choice for many applications that used to be performed on traditional minicomputers. Among scientific sites, workstations are favored by 38% of the respondents (up from 32% in last year's survey) compared with 48% for minicomputers (down from 51%). In office applications, personal computers are being emphasized by 59% of the respondents (up from 52% last year), while

FIG. 9

SURVEY SHOWS COMPAQ IN NUMBER TWO POSITION IN SHARE OF PLANNED PC PURCHASES

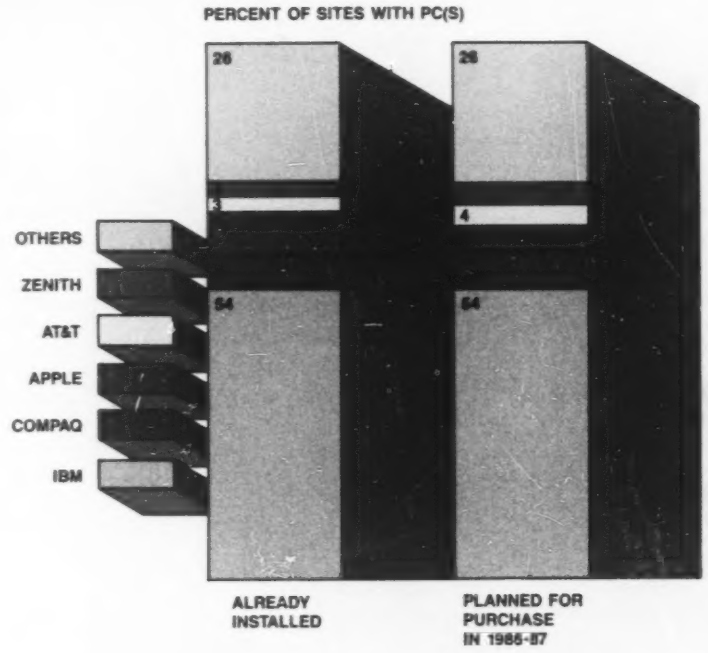
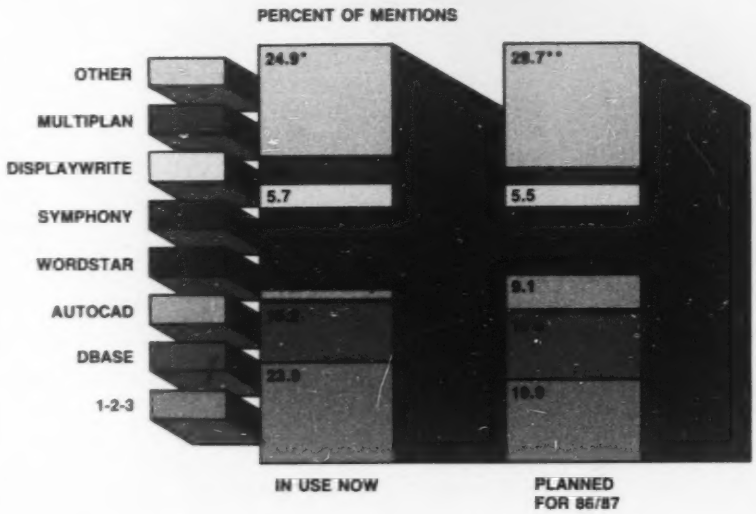


FIG. 10

AUTOCAD PC SOFTWARE USAGE RISES SHARPLY

Query: Which pc applications software package does your organization principally use now and which are planned for use (initially or additionally) in 1986-87?



*Includes Wordperfect 2.4%, Multimate 2.2%, Framework 1.9%, Microsoft Word 1.3%, Topview 1.1%

**Included Wordperfect 3.1%, Topview 2.3%, Multimate 2.1%, Framework 1.9%, RBase 1.4%, Microsoft Word 1.2%

minis dropped to 40% from 44% last year.

The traditional minicomputer is still finding widespread use in integrated office systems such as DEC's All-in-One and Data General's CEO (see Fig. 6). The departmental mini was chosen by 55% of those planning to implement an integrated office system, followed by 22% for mainframe host-based systems, 15% for networked pcs, and 8.7% for standalone pcs. Among IBM sites, the mainframe is still the chosen vehicle (at 33%, compared with 31% for minis) for such office systems. Additionally, it was found that the mini vendors are selling the lion's share (upwards of 75%) of their integrated office systems to their respective installed bases; Data General seems to have made the greatest penetration of its base. But DEC's share of the installed and pending integrated office market is now 26%, topping IBM at 20.3%, Data General (11.6%), Wang (10.9%), and HP (5.4%). DG's and Wang's share of this market is expected to shrink in coming months as IBM and DEC gain ground.

ONGOING SUCCESS FOR INTEL

Turning to the microcomputer and personal computer arenas, the survey revealed ongoing success by the Intel microprocessor family (8088, 8086, etc.) and by IBM-compatible personal computers. Intel, chosen by 57.3% of the sites buying microprocessors during the next 18 months, beat Motorola (24.9%) in the microprocessor sweeps. Intel's projected shipments to those sites during that period were expected to be close to triple those seen in the previous like period. The company's 8088 part is still a big seller (17.5% of Intel's total units to be shipped); the 80286 will garner 6.0% of coming shipments, while the 80186 captures 7.3%.

Motorola is by no means out of the race, however. It is enjoying strong demand for its 68020 component, which is used in Apple's Macintosh and a variety of workstation products. The part will make up 33% of the units shipped to survey respondents in the coming 18 months, up from 16.7% for the previous like period.

Year-to-year growth in the personal computer user base has once again slowed, according to the survey. The rate hit 15% this year, down from 31% in last year's survey and the 85% recorded in 1982 when the IBM PC was shipping in great initial volumes. Breaking down this rate by supplier, the survey found that the IBM PC base will grow by only 10% this year while Apple's will grow by 8%. The banking, education, and government sectors were among the most saturated with pcs of various kinds: upwards of 90% have them installed.

SURVEY METHOD

This year's 1986-87 DATAMATION/Cowen & Co. mini/micro computer survey began July 7, 1986, when over 61,000 questionnaires were mailed to DATAMATION subscribers who had previously indicated that they purchased small computers of one kind or another. In addition, approximately 5,000 questionnaires were sent to readers who had not indicated any prior usage of such machines.

Replies, collected through Aug. 21, yielded some 6,900 qualified, unduplicated responses from users across the country. The staff of Cowen & Co., a Boston brokerage house, tallied results, analyzed data, and presented its findings to institutional investor clients on Sept. 28.

The survey defined minicomputers as including cpus such as the Digital Equipment Corp. PDP-11, VAX, and 4300, mini-based small business systems, user-programmable terminals, data entry systems, office systems, and workstations. The latter are single- or multi-user desktop systems, generally priced above $7,500 each; typical examples are products from Apollo and Sun Microsystems and the IBM RT PC. Personal computers are single-user systems priced below $7,500, including the Apple Macintosh, IBM PC, and Compaq. Finally, the survey asked about users' purchases of unbundled microprocessor chips, typically used by oems in building some larger machine.

IBM's share of first-time pc users dropped this year to 46% from 63% last year, as the many clones gained market share. The clones have benefited from a shift in priorities by users when it comes to choosing pcs—price is significantly more important a factor than it was a year ago, second to compatibility with a prior system, but for the first time ahead of the availability of software (see Fig. 7). Product reputation and supplier viability, two of IBM's long suits, dropped in importance, too. Gaining the most from this shift has been Compaq, the leading clone maker, which users rated better than IBM in the product reputation category—47% of answering Compaq sites, compared with only 41% for IBM, ranked product reputation as the most important criterion for choosing a pc vendor (see Fig. 8).

The pc software market shows few signs of fueling new pc growth. While packaged applications software for personal computers was once again rated better than that available for minicomputers—helping the smaller machines gain in usage for new applications—no dramatic new generic class of applications (e.g., spreadsheet or word processing) has yet emerged to do what VisiCalc once did. The fastest-growing pc application is database management, which accounted for 13.1% of respondents' total elapsed time at their machines (compared with only 5.6% last year); spreadsheet usage fell to 31% from 33%, while word processing continued to rise. Only a small uptick, to 5.1 hours from 4.9 hours, was seen in daily pc usage.

The two most widely used software packages were once again Lotus 1-2-3 and WordStar, with 32% and 10.3% of mentions, respectively, followed by dBase at 10.1%. As for those packages planned for use in the following 18 months, AUTOCAD, a computer aided design package sold by Autodesk, Sausalito, Calif., showed particularly strong growth—to 9.1% of mentions from 3.2% in use now.

The survey resulted in some findings about how money is spent for pcs. Spending for packaged software, as opposed to hardware, still accounts for about a fifth of the dollars respondents lay out for pc systems. Independent stores continue to be the primary channel of distribution for the majority of sites, but in terms of total units shipped, the manufacturers themselves have most of the business.

IBM STILL DOMINATES PC SCENE

IBM's domination of the pc scene remains unchecked, although the company seems to have suffered here and there from the clones and other vendors. For instance, the survey found for the first time that IBM's share of the number of sites with installed pcs has dropped. Where last year IBM was cited as the primary supplier at 56.3% of the responding sites, this year it was cited by 53.9%—the "other" category, which includes clone makers such as Compaq (5.9%) and AT&T (2.6%), grew to 32.2% from 25.5% last year. IBM's share of the sites planning to purchase pcs is expected to fall to 54%, from 62% last year. Apple's share of such sites remains at 5%, leaving Compaq, with 7% of the sites, as number two behind IBM (see Fig. 9).

While at the time of the survey many sites were expecting their mini and pc vendors to come out with new personal computer gear, there seemed little sign of a strong wave of replacement activity in the pc market. More speed and better networking capabilities topped the list of most wanted improvements, but not overwhelmingly. Even if such features were available, only a fifth of the responding sites said they would be "very likely" to replace their current machines. Add to that the expectation of further decline in the growth of dp hardware budgets for the next few years (8.6% increase per year now, compared with 9.3% expected in last year's tally), and there seems little likelihood of a major resurgence in pc shipments anytime soon. ◉

To order the complete 1985-86 DATAMATION/Cowen & Co. Mini/Micro Survey results, please call Laurie Schnepf at (212) 605-9726.